



(11) **EP 3 293 576 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
01.08.2018 Bulletin 2018/31

(51) Int Cl.:
G03F 9/00 (2006.01) G03F 7/20 (2006.01)

(43) Date of publication A2:
14.03.2018 Bulletin 2018/11

(21) Application number: **17185142.1**

(22) Date of filing: **07.08.2017**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **09.09.2016 JP 2016176468**

(71) Applicant: **SCREEN Holdings Co., Ltd.**
Kyoto 602-8585 (JP)

(72) Inventors:
• **Mizuno, Hirofumi**
KYOTO-SHI, Kyoto 602-8585 (JP)
• **Shigeno, Yukihide**
KYOTO-SHI, Kyoto 602-8585 (JP)
• **Uemura, Haruo**
KYOTO-SHI, Kyoto 602-8585 (JP)

(74) Representative: **Kilian Kilian & Partner**
Aidenbachstraße 54
81379 München (DE)

(54) **PATTERN EXPOSURE DEVICE, EXPOSURE HEAD, AND PATTERN EXPOSURE METHOD**

(57) A technology of excellently performing focusing of patterned light is provided. A pattern exposure device includes an exposure head configured to output patterned light to a photosensitive material surface of a substrate, a measurement device configured to measure the position of the substrate, and a focus control unit config-

ured to adjust an imaging position of the patterned light in accordance with the position of the photosensitive material surface of the substrate. The exposure head includes a lens moving unit configured to move a second lens of a first imaging optical system and a micro lens array in directions toward and away from a first lens.

EP 3 293 576 A3



EUROPEAN SEARCH REPORT

Application Number
EP 17 18 5142

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2009/046262 A1 (OKAZAKI YOJI [JP] ET AL) 19 February 2009 (2009-02-19) * paragraphs [0071], [0091]; figures 1-3,7 *	1-7	INV. G03F9/00 G03F7/20
A	US 2004/189970 A1 (TAKADA NORIHISA [JP]) 30 September 2004 (2004-09-30) * the whole document *	1-7	
A	US 2009/251676 A1 (KOMORI KAZUKI [JP] ET AL) 8 October 2009 (2009-10-08) * the whole document *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			G03F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 June 2018	Examiner Angioni, Catherine
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 18 5142

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-06-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009046262 A1	19-02-2009	CN 101142534 A	12-03-2008
		JP 2006261155 A	28-09-2006
		KR 20070115972 A	06-12-2007
		TW 200639573 A	16-11-2006
		US 2009046262 A1	19-02-2009
		WO 2006098391 A1	21-09-2006
US 2004189970 A1	30-09-2004	CN 1532577 A	29-09-2004
		JP 4057937 B2	05-03-2008
		JP 2004296531 A	21-10-2004
		KR 20040084744 A	06-10-2004
		TW I360027 B	11-03-2012
		US 2004189970 A1	30-09-2004
		US 2006158635 A1	20-07-2006
US 2009251676 A1	08-10-2009	CN 101189556 A	28-05-2008
		JP 2006337834 A	14-12-2006
		KR 20080017400 A	26-02-2008
		US 2009251676 A1	08-10-2009
		WO 2006129653 A1	07-12-2006